directions for SMR submittal in the event there will be service interruption for electronic submittal.

2. The Discharger shall report in the SMR the results for all monitoring specified in this MRP under Sections III through VIII. The Discharger shall submit monthly SMRs, including the results of all required monitoring using USEPA-approved test methods or other test methods specified in this Order. Monthly SMRs shall be due 30 days after the end of each calendar month. If the Discharger monitors any pollutant more frequently than required by this Order, the results of this monitoring shall be included in the calculations and reporting of the data submitted in the SMR. Annual SMRs shall be due by February 1 of each year, covering the previous calendar year. The report shall contain the items described in the Regional Water Board's Standard Provisions and SMP Part A (Attachment G).

3. Monitoring periods and reporting for all required monitoring shall be completed according to the following schedule:

Table E-6. Monitoring Periods

Sampling Frequency	Monitoring Period Begins On…	Monitoring Period
Continuous	Permit effective date	All
1/hour	Permit effective date	Every hour on the hour
1/day	Permit effective date	(Midnight through 11:59 PM) or any 24-hour period that reasonably represents a calendar day for purposes of sampling.
5/week	Permit effective date	Sunday through Saturday
1/week	Permit effective date	Sunday through Saturday
1/month	Permit effective date	First day of calendar month through last day of calendar month
1/quarter	Permit effective date	Once during January 1 – March 31, April 1- June 30, July 1 – September 30, and October 1 – December 31
2/year	Permit effective date	Once during wet season (typically November 1 through April 30), once during dry season (typically May 1 through October 31)

4. The Discharger shall report with each sample result the applicable reported Minimum Level (ML) and the current Method Detection Limit (MDL), as determined by the procedure in Part 136. The Discharger shall report the results of analytical determinations for the presence of chemical constituents in a sample using the following reporting protocols:

   a. Sample results greater than or equal to the reported ML shall be reported as measured by the laboratory (i.e., the measured chemical concentration in the sample).

   b. Sample results less than the RL, but greater than or equal to the laboratory's MDL, shall be reported as "Detected, but Not Quantified," or DNQ. The estimated chemical concentration of the sample shall also be reported.

      For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ as well as the words "Estimated Concentration" (may be shortened to "Est. Conc."). The laboratory may, if such information is available, include numerical estimates of the data quality for the reported result. Numerical estimates of

data quality may be percent accuracy (+ a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.

c. Sample results less than the laboratory's MDL shall be reported as "Not Detected," or ND.

d. Dischargers are to instruct laboratories to establish calibration standards so that the ML value (or its equivalent if there is differential treatment of samples relative to calibration standards) is the lowest calibration standard. At no time is the Discharger to use analytical data derived from extrapolation beyond the lowest point of the calibration curve for compliance determination.

e. Compliance with effluent limitations for priority pollutants shall be determined using sample reporting protocols defined above, Attachment A, and Table E-1, priority pollutant MLs of this Order. For purposes of reporting and administrative enforcement by the Regional and State Water Boards, the Discharger shall be deemed out of compliance with effluent limitations if the concentration of the priority pollutant in the monitoring sample is greater than the effluent limitation and greater than or equal to the reporting level (RL).

f. When determining compliance with an AMEL (or average weekly effluent limit) for priority pollutants and more than one sample result is available, the Discharger shall compute the arithmetic mean unless the data set contains one or more reported determinations of DNQ or "Not Detected" (ND). In those cases, the Discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:

(1) The data set shall be ranked from low to high, ranking the reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.

(2) The median value of the data set shall be determined. If the data set has an odd number of data points, then the median is the middle value. If the data set has an even number of data points, then the median is the average of the two values around the middle unless one or both of the points are ND or DNQ, in which case the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.

5. The Discharger shall submit SMRs in accordance with the following requirements:
The Discharger shall arrange all reported data in a tabular format. The data shall be summarized to clearly illustrate whether the facility is operating in compliance with interim and/or final effluent limitations. The Discharger is not required to duplicate the submittal of data that is entered in a tabular format within CIWQS. When electronic submittal of data is required and CIWQS does not provide for entry into a tabular format within the system, the Discharger shall electronically submit the data in a tabular format as an attachment.

The Discharger shall attach a cover letter to the SMR. The information contained in the cover letter shall (1) clearly identify violations of the WDRs, (2) discuss corrective actions

taken or planned, and (3) propose time schedule for corrective actions. Identified violations must include a description of the requirement that was violated and a description of the violation.

SMRs must be submitted to the Regional Water Board, signed and certified as required by the Standard Provisions (Attachment D), to the address listed below:

Executive Officer
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612
ATTN: NPDES Permit Division

C. Discharge Monitoring Reports (DMRs)

1. As described in Section XI.B.1 above, at any time during the term of this Order, the State or Regional Water Board may notify the Discharger to electronically submit SMRs that will satisfy federal requirements for submittal of DMRs. Until such notification is given, the Discharger shall submit DMRs in accordance with the requirements described below.

2. DMRs must be signed and certified as required by the standard provisions (Attachment D). The Discharge shall submit the original DMR and one copy of the DMR to one of the addresses listed below:

Standard Mail	FedEx/UPS/Other Private Carriers
State Water Resources Control Board Division of Water Quality c/o DMR Processing Center PO Box 100 Sacramento, CA 95812-1000	State Water Resources Control Board Division of Water Quality c/o DMR Processing Center 1001 I Street, 15th Floor Sacramento, CA 95814

3. All discharge monitoring results must be reported on the official USEPA pre-printed DMR forms (USEPA Form 3320-1). Forms that are self-generated will not be accepted unless they follow the exact same format of USEPA Form 3320-1.

D. Other Reports

In the first monthly SMR following the respective due dates, the Discharger shall report the results of any special studies, monitoring, and reporting required by Section VI.C.2 (Special Studies, Technical Reports, and Additional Monitoring Requirements) of this Order. The Discharger shall include a report of progress towards meeting compliance schedules established by Section VI.C.6.d of this Order in the annual SMR.

APPENDIX E-1

CHRONIC TOXICITY
DEFINITION OF TERMS AND SCREENING PHASE REQUIREMENTS

I. Definition of Terms

A. No observed effect level (NOEL) for compliance determination is equal to IC_{25} or EC_{25}. If the IC_{25} or EC_{25} cannot be statistically determined, the NOEL shall be equal to the NOEC derived using hypothesis testing.

B. Effective concentration (EC) is a point estimate of the toxicant concentration that would cause an adverse effect on a quantal, "all or nothing," response (such as death, immobilization, or serious incapacitation) in a given percent of the test organisms. If the effect is death or immobility, the term lethal concentration (LC) may be used. EC values may be calculated using point estimation techniques such as probit, logit, and Spearman-Karber. EC_{25} is the concentration of toxicant (in percent effluent) that causes a response in 25 percent of the test organisms.

C. Inhibition concentration (IC) is a point estimate of the toxicant concentration that would cause a given percent reduction in a nonlethal, nonquantal biological measurement, such as growth. For example, an IC_{25} is the estimated concentration of toxicant that would cause a 25 percent reduction in average young per female or growth. IC values may be calculated using a linear interpolation method such as USEPA's Bootstrap Procedure.

D. No observed effect concentration (NOEC) is the highest tested concentration of an effluent or a toxicant at which no adverse effects are observed on the aquatic test organisms at a specific time of observation. It is determined using hypothesis testing.

II. Chronic Toxicity Screening Phase Requirements

A. The Discharger shall perform screening phase monitoring:

1. Subsequent to any significant change in the nature of the effluent discharged through changes in sources or treatment, except those changes resulting from reductions in pollutant concentrations attributable to source control efforts, or

2. Prior to permit reissuance. Screening phase monitoring data shall be included in the NPDES permit application for reissuance. The information shall be as recent as possible, but may be based on screening phase monitoring conducted within 5 years before the permit expiration date.

B. Design of the screening phase shall, at a minimum, consist of the following elements:

1. Use of test species specified in Appendix E-2, attached, and use of the protocols referenced in those tables, or as approved by the Executive Officer.

2. Two stages:
   a. Stage 1 shall consist of a minimum of one battery of tests conducted concurrently. Selection of the type of test species and minimum number of tests shall be based on Appendix E-2 (attached).

   b. Stage 2 shall consist of a minimum of two test batteries conducted at a monthly frequency using the three most sensitive species based on the Stage 1 test results and as approved by the Executive Officer.

3. Appropriate controls.

4. Concurrent reference toxicant tests.

5. Dilution series with a control and five effluent concentrations (including 100% effluent) and using a dilution factor ≥ 0.5.

C. The Discharger shall submit a screening phase proposal acceptable to the Executive Officer. The proposal shall address each of the elements listed above. If within 30 days, the Executive Officer does not comment, the Discharge shall commence with screening phase monitoring.

APPENDIX E-2

SUMMARY OF TOXICITY TEST SPECIES REQUIREMENTS

Table AE-1. Critical Life Stage Toxicity Tests for Estuarine Waters

Species	(Scientific Name)	Effect	Test Duration	Reference
Alga	(Skeletonema costatum) (Thalassiosira pseudonana)	Growth rate	4 days	1
Red alga	(Champia parvula)	Number of cystocarps	7–9 days	3
Giant kelp	(Macrocystis pyrifera)	Percent germination; germ tube length	48 hours	2
Abalone	(Haliotis rufescens)	Abnormal shell development	48 hours	2
Oyster Mussel	(Crassostrea gigas) (Mytilus edulis)	Abnormal shell development; percent survival	48 hours	2
Echinoderms - Urchins Sand dollar	(Strongylocentrotus purpuratus, S. franciscanus) (Dendraster excentricus)	Percent fertilization	1 hour	2
Shrimp	(Mysidopsis bahia)	Percent survival; growth	7 days	3
Shrimp	(Holmesimysis costata)	Percent survival; growth	7 days	2
Topsmelt	(Atherinops affinis)	Percent survival; growth	7 days	2
Silversides	(Menidia beryllina)	Larval growth rate; percent survival	7 days	3

Toxicity Test References:

1. American Society for Testing Materials (ASTM). 1990. Standard Guide for Conducting Static 96-Hour Toxicity Tests with Microalgae. Procedure E 1218-90. ASTM, Philadelphia, PA.
2. Short-term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to West Coast Marine and Estuarine Organisms. EPA/600/R-95/136. August 1995.
3. Short-term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to Marine and Estuarine Organisms. EPA/600/4-90/003. July 1994.

Table AE-2. Critical Life Stage Toxicity Tests for Fresh Waters

Species	(Scientific Name)	Effect	Test Duration	Reference
Fathead minnow	(Pimephales promelas)	Survival; growth rate	7 days	4
Water flea	(Ceriodaphnia dubia)	Survival; number of young	7 days	4
Alga	(Selenastrum capricornutum)	Final cell density	4 days	4

Toxicity Test Reference:

4. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, fourth Edition Chronic manual (EPA-821-R-02-013, October 2002)..

Table AE-3. Toxicity Test Requirements for Stage One Screening Phase

Requirements	Receiving Water Characteristics		
	Discharges to Coast	Discharges to San Francisco Bay[2]	
	Ocean	Marine/Estuarine	Freshwater
Taxonomic diversity	1 plant 1 invertebrate 1 fish	1 plant 1 invertebrate 1 fish	1 plant 1 invertebrate 1 fish
Number of tests of each salinity type: Freshwater[1] Marine/Estuarine	0 4	1 or 2 3 or 4	3 0
Total number of tests	4	5	3

1. The freshwater species may be substituted with marine species if:

   a. The salinity of the effluent is above 1 part per thousand (ppt) greater than 95 percent of the time, or

   b. The ionic strength (TDS or conductivity) of the effluent at the test concentration used to determine compliance is documented to be toxic to the test species.

2. a. Marine/Estuarine refers to receiving water salinities greater than 1 ppt at least 95 percent of the time during a normal water year.

   b. Fresh refers to receiving water with salinities less than 1 ppt at least 95 percent of the time during a normal water year.

ATTACHMENT F – FACT SHEET

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ATTACHMENT F – FACT SHEET

As described in Section II of this Order, this Fact Sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of this Order.

This Order has been prepared under a standardized format to accommodate a broad range of discharge requirements for dischargers in California. Only those sections or subsections of this Order that are specifically identified as "not applicable" have been determined not to apply to this Discharger. Sections or subsections of this Order not specifically identified as "not applicable" are fully applicable to this Discharger.

I. PERMIT INFORMATION

The following table summarizes administrative information related to the facility.

Table F-1. Facility Information

WDID	2 438014001
CIWQS Place ID	255333
Discharger	City of San Jose, City of Santa Clara, San Jose/Santa Clara Water Pollution Control Plant, a joint powers authority
Name of Facility	San Jose/Santa Clara Water Pollution Control Plant, City of San Jose's sewage collection system, City of Santa Clara's sewage collection system
Facility Address	700 Los Esteros Road San Jose CA 9134 Santa Clara County
Facility Contact, Title, Phone	David Tucker, Program Manager, (408) 945-5316
Authorized Person to Sign and Submit Reports	John Stufflebean, Director of Environmental Services, (408) 535-8560
Mailing Address	Same as Facility Address
Billing Address	Same as Facility Address
Type of Facility	Publicly Owned Treatment Works (POTW)
Major or Minor Facility	Major
Threat to Water Quality	1
Complexity	A
Pretreatment Program	Yes
Reclamation Requirements	Yes, under Order No. 95-117
Mercury Discharge Requirements	Yes, under Order No. R2-2007-0077
Facility Permitted Flow	---
Facility Design Flow	167 million gallons per day (MGD) (average dry weather flow design capacity with full tertiary treatment) 261 MGD (peak wet weather design flow capacity with full tertiary treatment)
Watershed	Santa Clara Hydrologic Unit
Receiving Water	Artesian Slough
Receiving Water Type	Estuarine
Service Areas	Cities of San Jose, Santa Clara, and Milpitas; Santa Clara County Sanitation Districts No. 2 and No. 3; the West Valley Sanitation District including Campbell, Los Gatos, Monte Sereno and Saratoga; and the Cupertino, Burbank, and Sunol Sanitary Districts
Service Area Population	1,365,000

A. The City of San Jose and the City of Santa Clara (hereinafter collectively the Discharger) own the San Jose/Santa Clara Water Pollution Control Plant (Plant) through a Joint Powers Agreement (JPA) and the City of San Jose operates the Plant as the administering agency of the

JPA. The City of San Jose and the City of Santa Clara individually own and operate their respective collection systems. The Plant, the City of San Jose's collection system, and the City of Santa Clara's collection system are collectively considered the facility. The facility provides tertiary treatment of the wastewater collected from its service areas and discharges to Artesian Slough, a tributary to South San Francisco Bay via Coyote Creek. The ownership and operation of the Plant and the collection systems, including satellite collection systems, are further described in Fact Sheet Section II, Facility Description.

For the purposes of this Order, references to the "discharger" or "permittee" in applicable federal and state laws, regulations, plans, or policy are held to be equivalent to references to the Discharger herein.

B. The discharge of treated wastewater from the Plant to Artesian Slough, a water of the United States, has been regulated by Order No. R2-2003-0085 (previous Order) and NPDES Permit No. CA0037842, which was adopted on November 1, 2003, and expired on September 30, 2008.

C. The Discharger filed a Report of Waste Discharge (ROWD) and submitted an application for reissuance of its Waste Discharge Requirements (WDRs) and NPDES permit on April 1, 2008, and submitted revisions and supplementals on April 10, and April 25, 2008. The application was deemed complete and the previous Order has been administratively extended.

II. FACILITY DESCRIPTION

A. Description of Wastewater and Biosolids Treatment or Controls

1. Wastewater Treatment Processes

The Discharger owns and operates the Plant, which provides primary, secondary, and tertiary treatment of domestic and commercial wastewater collected from its service areas as indicated in Table F-1. The Discharger's current service population is approximately 1.4 million.

The Plant is owned and operated by a JPA comprised of the City of San Jose and the City of Santa Clara, under conditions stipulated in a master agreement entitled "Agreement between San Jose and Santa Clara Respecting Sewage Treatment Plant" dated May 6, 1959. The terms of the Agreement apply exclusively to the ownership and operations of the Plant. Each municipality retained separate ownership and responsibility for their sewage collection systems. Through a series of additional "Master Agreements for Wastewater Treatment," six additional satellite collection systems obtained rights to a share of Plant treatment capacity to treat their discharged sewage. The six additional satellite collection systems that discharge into the Plant are: the City of Milpitas, Burbank Sanitation District, Cupertino Sanitation District, West Valley Sanitation District, Sunol Sanitation District, and Santa Clara County Sanitation Districts No. 2 and No. 3. The satellite collection systems are discussed further in Fact Sheet Section II.A.2, "Satellite Collection Systems."

Wastewater treatment processes at the Plant include screening and grit removal, primary sedimentation, secondary treatment with the activated sludge process, ammonia removal, secondary clarification, filtration, disinfection (chlorine gas), and dechlorination (sulfur dioxide). Frequent filter backwashing to clean the filter media is a routine part of filter

operation. Filter backwash water is managed as described below under **Filtration Process**. The Plant is designed to route fully treated secondary effluent flow in excess of the tertiary filtration design capacity around the filters (250 MGD) during extreme wet weather flow events, and to recombine it with filter effluent prior to disinfection.

Influent Flow Management. In 2007, a new headworks, Raw Sewage Pump Station No. 2, and various yard structures and pipelines were constructed to increase the sustained hydraulic capacity (from several hours to possibly 12 hours) of the Plant to 300 MGD and the peak hydraulic capacity to 400 MGD. An Emergency Overflow Basin (earthen) was constructed to allow for storage of raw sewage when influent flows exceeded 400 MGD, and which will allow for a peak hydraulic loading of 400 MGD for up to several hours. The basin will also serve as emergency storage of raw sewage in the event of a power failure or when downstream processes or equipment are shut down for maintenance activities. The new headworks (screenings, grit removal, and pumping) capacity was designed for 160 MGD, and supplements the old headworks capacity rated at 271 MGD; however, these capacities are not completely additive, because the treatment process immediately downstream primary clarifiers process has a maximum hydraulic capacity of 380 MGD; and further downstream treatment units, such as filters, have lower sustained capacity as explained below under **Filtration Process**.

Preliminary Treatment. Preliminary treatment consists of wastewater passing through bar screens, removing large debris from the raw sewage, followed by grit removal.

Primary Treatment. Following preliminary treatment, wastewater is pumped into rectangular primary clarifiers for the removal of floatable and settled material. The floatable material is skimmed off and pumped to a scum/grease concentration system. The concentrated scum is then pumped into disposal containers and sent to a local Class III landfill. The settled primary solids are removed from the bottom of the clarifiers using rotating chain and flight collectors and are discharged into sludge pits located at the head end of the clarifier. The thickened primary sludge is then pumped directly into the anaerobic digesters.

Preliminary and primary treatment removes approximately 40 to 60 percent of suspended solids, and 20 to 50 percent of biological oxygen demand (BOD). The primary effluent, with remaining BOD and colloidal and non-settleable solids, is then pumped to the biological treatment process.

Biological Treatment. All wastewater flow receives biological (secondary) treatment. The wastewater treatment practice used is a modified biological nutrient removal (BNR) process that is designed to remove BOD and ammonia (NH_3) in the same aeration basins. Each basin is divided into four sections referred to as "quads". The first and third quads are operated under anoxic conditions, while the second and fourth quads are operated under aerobic conditions. This configuration achieves effective filament control and allows for some denitrification. The biological system is controlled with sludge age, which runs around 5 – 7 days. Complete removal of ammonia (nitrification) is achieved in the aeration tanks. The mixed liquor from the aeration basins flows to secondary clarifiers for solids removal via settling. The majority of settled solids are returned (return activated sludge) to the aeration basins, and the remainder (waste activated sludge) is pumped to dissolved air flotation tanks for solids thickening and digestion.

Filtration Process. Following biological treatment, the wastewater is pumped to the tertiary filtration process for additional treatment. The filters provide removal of the BOD and suspended solids remaining from biological treatment via gravity filtration through dual media filters consisting of silica sand and anthracite coal—all supported by an under drain system. There are 16 separate filters, 4 of which are dedicated to producing Title 22 unrestricted-use reclaimed water, and 12 of which produce water suitable for discharge to San Francisco Bay. Filter backwash water is sent to a backwash equalization basin for storage, followed by alum addition and then flocculation and sedimentation. The treated backwash water is pumped to chlorine contact tanks for disinfection prior to discharge to San Francisco Bay. The settled solids from the backwash water are pumped back to primary treatment.

Sustained hydraulic capacity during peak wet weather flow condition is determined by the performance of the filter system. There are 12 dedicated filters that can filter 300 MGD of secondary treated wastewater for an indefinite period if no particulate matter is present. In reality, under normal operations each filter must be backwashed after roughly 12 to 20 hours of operation depending on clarity of the water being filtered. This means that on average, one filter is off line at any given time and total filter capacity is reduced by roughly 25 MGD. In an emergency peak flow situation, filter backwash would be suspended. After several hours of operation, filter performance would degrade to a point that filters would have to be taken off line for backwash or they become inoperable.

Disinfection. Chlorine gas is metered into the filter effluent at the head of four serpentine chlorine contact channels. Ammonia is also metered into the same location to produce a solution of chloramines for disinfection. Chloramination provides the needed disinfection as the effluent travels through the chlorine contact channels. The contact time varies with the flow, but contact time is typically 30 to 45 minutes. As the effluent leaves the contact channels its chlorine residual is measured and an appropriate amount of sulfur dioxide is added to neutralize the chlorine. In the event of a failure in either the chlorine or sulfur dioxide gas systems there are backup dosing points and backup liquid sodium hypochlorite and sodium bisulfite systems. When required, caustic soda is added following dechlorination for pH adjustment. Most of the water is destined for discharge to the Bay, but an average of about 10 MGD is diverted for recycled water use in numerous locations throughout the service area.

Solids Management. The dissolved air floatation system receives wasted activated sludge from the secondary clarifiers. The dissolved air flotation process thickens the sludge from around 1% to 4% total solids before it is pumped to the anaerobic digesters. Supernatant from the dissolved air floatation process is returned to the headworks for treatment. Digested sludge from the anaerobic digesters is pumped to deep (10 feet) storage lagoons where the sludge remains for over two years undergoing additional stabilization and thickening. The sludge is then harvested using floating dredges and pumped to shallow solar drying beds. Special tractors, with aeration equipment, turn the sludge over a period of several weeks to dry the biosolids to more than 75% total solids. Once dried, the biosolids are transported via an outside contractor to a local landfill for use as alternative daily cover.

Collection Systems. The City of San Jose sanitary sewer system consists of approximately 2,200 miles of sewer pipes (which vary in size from 6 inches to 90 inches in diameter),

45,000 manholes and 16 pump stations. The collected wastewater is conveyed to the Plant by major interceptor pipelines located in the northern part of San Jose.

The City of Santa Clara sanitary sewer system consists of approximately 270 miles of sewer mains. The sanitary sewer system also includes two large pump stations, each with a flow meter, and four smaller un-metered lift stations. The system includes over 5,300 manholes, 2 force mains (totaling 4 miles), 26 siphons, and an additional main line meter station to measure flow at the Guadalupe outfall to the conveyance pipe to the Plant.

2. Satellite Collection Systems

The Plant serves multiple cities and wastewater districts as indicated in Table F-1 above. In addition to the City of San Jose's and City of Santa Clara's respective collection systems, wastewater is conveyed to the Plant by several satellite collection systems serving the City of Milpitas; Santa Clara County Sanitation Districts No. 2 and No. 3; the West Valley Sanitation District, including Campbell, Los Gatos, Monte Sereno and Saratoga; and the Cupertino, Burbank, and Sunol Sanitary Districts. Satellite collection systems are not part of the facility subject to the requirements of this Order.

The Milpitas sanitary sewer system collects wastewater from a population of approximately 63,800 through 163 miles of sewers. Wastewater flows are conveyed mostly by gravity to the Milpitas Main Pump Station, which pumps all the flow to the Plant through two force mains. A second pump station connects a low-elevation portion of Milpitas to the gravity sewer system. The sewer system also includes a number of siphons.

West Valley Sanitation District consists of 426 miles of main and trunk sewers and 206 miles of sewer laterals, for a total of 632 miles of sewer lines. The system also includes 3 pump stations and 57 inverted siphons.

Sunol Sanitary District is located within three unincorporated areas surrounded by the City of San Jose. The District owns approximately 3.9 miles of sewer lines that are mostly six inches in diameter. The District is in the process of decomissioning itself as its service area is being incorporated into City of San Jose's collection system.

Burbank Sanitary District is located in an unincorporated section of Santa Clara County surrounded by the City of San Jose. The District operates and maintains approximately 7 miles of sewer lines and transports approximately 336,000 gallons of wastewater per day to the Plant.

County Sanitation District Nos. 2 and 3 is located within two unincorporated areas surrounded by the City of San Jose. The District consists of approximately 90 miles of sewer lines and 7,000 connections. This is the maximum service area since the District will shrink in size as portions are annexed to the City of San Jose.

Each satellite collection system is owned, operated, and maintained independently from the Discharger, and is responsible for an ongoing program of maintenance and capital improvements for sewer lines and pump stations within its respective jurisdiction in order to ensure adequate capacity and reliability of the collection system. Their responsibilities

include managing overflows, controlling Infiltration and Inflow (I&I) and implementing collection system maintenance.

3. Reclamation

A fraction of tertiary treated water is recycled and used in numerous locations throughout the service area via the South Bay Water Recycling Program. The Discharger provides approximately 10 MGD of tertiary treated wastewater for non-potable purposes to over 350 customers throughout the service area. Customer uses include irrigation of golf courses, parks and playgrounds, farms, as well as industrial use. Recycled water is also available for construction use at remote locations. Approximately 0.10 MGD of tertiary treated wastewater is also used seasonally for landscape irrigation of 50 acres on-site. Water recycling requirements for the South Bay Water Recycling Program are regulated under a separate permit, Order No. 95-117.

4. Storm Water Discharges

All storm water from within the Plant is directed to the headworks of the Plant; therefore, this Order regulates the discharges of storm water that originate on the grounds of the Plant, and coverage under the Statewide permit for discharges of storm water associated with industrial activities (NPDES General Permit No. CAS000001) is not required.

B. Discharge Point and Receiving Water

The location of the discharge point and the receiving water are shown in Table F-2 below.

Table F-2. Outfall Location

Discharge Point	Effluent Description	Discharge Point Latitude	Discharge Point Longitude	Receiving Water
001	Tertiary treated municipal wastewater	37° 26′ 23.38″ N	121° 57′ 29.18″ W	Artesian Slough

Artesian Slough is located in the Coyote Creek Hydrologic Area of the Santa Clara Hydrologic Unit and is tributary to South San Francisco Bay.

South San Francisco Bay is a unique and sensitive portion of the San Francisco Bay Estuary, in part due to the freshwater inflow being lower there than in the greater portion of San Francisco Bay. Tributaries to South San Francisco Bay are small in number and size. It is characterized by higher, more uniform salinities and is generally shallow, except for a deep central channel. Surrounding South San Francisco Bay is an extensive network of tidal mudflats, tidal sloughs, coastal salt marshes, diked salt marshes, brackish water marshes, salt ponds, and freshwater marshes. In general, water quality in the entire San Francisco Bay can be characterized as a concentration gradient, with the lowest concentrations in Central Bay and highest concentrations in South San Francisco Bay and the southern sloughs, due to there being less tidal mixing and flushing in South San Francisco Bay and the southern sloughs than elsewhere in San Francisco Bay.

C. Summary of Previous Requirements and Self-Monitoring Data

Effluent limitations contained in the previous Order for discharges to Artesian Slough and representative monitoring data from the term of the previous Order are presented in the following tables.

Table F-3. Previous Effluent Limitations and Monitoring Data for Conventional and Non-Conventional Pollutants

Parameter	(units)	Effluent Limitations			Monitoring Data (1/2003-1/2008)		
		Monthly Average	Weekly Average	Daily Maximum	Highest Monthly Average	Highest Weekly Average	Highest Daily Discharge
$CBOD_5$	mg/L	10	---	20	4.25[1]	---	6[1]
TSS	mg/L	10	---	20	7.14	---	12.9
pH	standard units	6.5 – 8.5			Minimum – 7.0 Maximum – 7.7		
Oil and Grease	mg/L	5	---	10	< 5	---	< 5
Enterococci	colonies/ 100 mL	35[2]	---	276[3]	4[2]	---	71[3]
Total Chlorine Residual	mg/L	---	---	0.0 [4]	---	---	0.0
Settleable Matter	mL/L-hr.	0.1	---	0.2	< 0.1	---	0.2
Turbidity	NTU	---	---	10	---	---	6
Acute Toxicity	% survival	[5]			Minimum percent survival – 97.8%		
Total Ammonia	mg/L as nitrogen	3	---	8	0.9	---	0.9

Footnotes for Table F-3:

"<" Analyte not detected in effluent; value given is the MDL as reported by the analytical laboratory.

(1) The Discharger monitored and reported this parameter as BOD.

(2) As a 30-day geometric mean.

(3) As a single sample maximum.

(4) Requirement defined as below the limit of detection in standard test methods defined in the latest USEPA approved edition of *Standard Methods for the Examination of Water and Wastewater*.

(5) The limits are an 11-sample median value of not less than 90 percent survival and an 11-sample 90th percentile value of not less than 70 percent survival.

Table F-4. Previous Effluent Limitations and Monitoring Data for Toxic Pollutants

Parameter	Units	Final Limits		Interim Limits		Monitoring Data (From 1/2003 to 1/2008)
		Daily Maximum	Monthly Average	Daily Maximum	Monthly Average	Highest Daily Concentration
Copper	µg/L	18	12	---	---	9.54
Mercury	µg/L	---	---	2.1	0.012	0.0200
Nickel	µg/L	34	25	---	---	12.3
4,4'-DDE	µg/L	---	---	0.05	---	< 0.0018
Dieldrin	µg/L	---	---	0.01	---	< 0.002
Heptachlor Epoxide	µg/L	---	---	0.01	---	< 0.002
Benzo(b)Fluoranthene	µg/L	---	---	10.0	---	< 0.02
Indeno(1,2,3-cd)Pyrene	µg/L	---	---	0.05	---	< 0.02

"<" Analyte not detected in effluent; value given is the minimum detection limit (MDL) as reported by the analytical laboratory.

D. Compliance Summary

1. **Compliance with Previous Numeric Effluent Limits.** There were no exceedances of numeric effluent limits during the term of the previous Order. There was one exceedance of the single-sample chronic toxicity monitoring trigger of 2.0 TUc, with a reported value of 2.4 TUc. Accelerated monitoring did not result additional exceedances; therefore, the Discharge was not required to take further actions.

2. **Compliance with Previous Provisions.** A list of special activities required by the previous Order and the status of those requirements are shown in Table F-5, below.

Table F-5. Compliance with Previous Order Provisions

Provision Number	Requirement	Status of Completion
E.2	Avian Botulism Control Program	Reports have been submitted annually by February 28.
E.3	Lab Reliability Evaluation for Aldrin	Lab reliability report was submitted January 15, 2004. Aldrin was not detected above the WQC during the permit term.
E.4	Mercury Special Study – POTW Fate and Transport	Workplan was submitted January 13, 2004. Mercury Fate and Transport Progress Report was submitted February 2006. Mercury Fate and Transport Interim Study Report was submitted March 2007. Mercury Fate and Transport Final Report was submitted December 2007.
E.7	Pollution Prevention and Minimization Program (PMP)	Reports have been submitted annually by February 28.
E.9	Copper-Nickel Water Quality Attainment Strategy	Reports have been submitted annually by February 28.
E.11	South Bay Action Plan (SBAP)	Reports have been submitted annually by February 28.
E.12	Wetlands Mitigation	All mitigation requirements were fulfilled December 2004 with contribution to Peninsula Open Space Trust, to assist in Bair Island restoration.
E.13	Salt Marsh Vegetative Assessment	Vegetative assessment report was submitted February 28, 2008.

Provision Number	Requirement	Status of Completion
E.14	California Clapper Rail and Salt Marsh Mouse Surveys	California Clapper Rail and Salt Marsh Harvest Mouse Survey report was submitted January 15, 2007.
E.17	Operations and Maintenance Manual and Reliability Report Updates	Reports have been submitted annually by February 28.
E.18	Contingency Plan Update	Reports have been submitted annually by February 28.
E.19	Annual Status Reports	Reports have been submitted annually by February 28.
E.20	303(d)-listed Pollutants Site-Specific Objective and TMDL Status Review	Letter was submitted January 28 2008, confirming participation in BACWA.

E. Planned Changes

The Plant is in the planning stages of an improvement project for alternative disinfection. The improvement project is estimated to be completed and operational by December 31, 2009.

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

This Order's requirements are based on the requirements and authorities described in this Section.

A. Legal Authorities

This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the California Water Code (CWC or Water Code, commencing with section 13370). It shall serve as a NPDES permit for point source discharges from this facility to surface waters. This Order also serves as WDRs pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

B. California Environmental Quality Act (CEQA)

Under CWC section 13389, this action to adopt an NPDES permit is exempt from the provisions of CEQA.

C. State and Federal Regulations, Policies, and Plans

1. **Water Quality Control Plans.** *The Water Quality Control Plan for the San Francisco Bay Basin* (the Basin Plan) is the Regional Water Board's master water quality control planning document. It designates beneficial uses and water quality objectives (WQOs) for waters of the state, including surface waters and groundwater. It also includes programs of implementation to achieve WQOs. The Basin Plan was adopted by the Regional Water Board and approved by the State Water Board, USEPA, and the Office of Administrative Law (OAL), as required. Requirements of this Order implement the Basin Plan.

   The Basin Plan does not specifically identify present and potential beneficial uses for Artesian Slough but does identify beneficial uses for Coyote Creek, to which Artesian Slough is tributary. The Basin Plan states that the beneficial uses of any specifically identified water body generally apply to all its tributaries (Basin Plan tributary rule). State Water Board Resolution No. 88-63 establishes state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply (MUN).

Because of tidal and marine influences on receiving waters for this discharge, total dissolved solids levels in Artesian Slough are expected to exceed 3,000 mg/L, thereby meeting an exception to Resolution No. 88-63. The MUN designation is therefore not applicable to Artesian Slough. Table F-6 identifies beneficial uses that are applicable to Coyote Creek. These beneficial uses also apply to Artesian Slough in accordance with the Basin Plan tributary rule.

Table F-6. Beneficial Uses of Coyote Creek

Discharge Point	Receiving Water Name	Beneficial Use(s) of Coyote Creek
001	Artesian Slough (tributary to Coyote Creek)	Groundwater Recharge (GWR) Cold Freshwater Habitat (COLD) Fish Migration (MIGR) Fish Spawning (SPWN) Warm Freshwater Habitat (WARM) Wildlife Habitat (WILD) Non-contact Water Recreation (REC-2) Contact Recreation (REC-1)

2. **National Toxics Rule (NTR) and California Toxics Rule (CTR).** USEPA adopted the NTR on December 22, 1992, and amended it on May 4, 1995, and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the CTR. The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria (WQC) for priority toxic pollutants, which are applicable to South San Francisco Bay.

3. **State Implementation Policy (SIP).** On March 2, 2000, the State Water Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP). The SIP became effective on April 28, 2000, with respect to the priority pollutant criteria promulgated for California by the USEPA through the NTR and to the priority pollutant objectives established by the Regional Water Board in the Basin Plan. The SIP became effective on May 18, 2000, with respect to the priority pollutant criteria promulgated by the USEPA through the CTR. The State Water Board adopted amendments to the SIP on February 24, 2005, that became effective on July 13, 2005. The SIP establishes implementation provisions for priority pollutant criteria and objectives and provisions for chronic toxicity control. Requirements of this Order implement the SIP.

4. **Alaska Rule.** On March 30, 2000, USEPA revised its regulation that specifies when new and revised state and tribal water quality standards (WQS) become effective for CWA purposes [65 Fed. Reg. 24641 (April 27, 2000), codified at 40 CFR 131.21]. Under the revised regulation (also known as the Alaska Rule), new and revised standards submitted to USEPA after May 30, 2000, must be approved by USEPA before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by May 30, 2000, may be used for CWA purposes, whether or not approved by USEPA.

5. **Antidegradation Policy.** 40 CFR 131.12 requires that the state WQS include an antidegradation policy consistent with the federal policy. The State Water Board established

California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The Regional Water Board's Basin Plan implements, and incorporates by reference, both the state and federal antidegradation policies. The permitted discharge must be consistent with the antidegradation provision of 40 CFR 131.12 and State Water Board Resolution No. 68-16.

6. **Anti-Backsliding Requirements.** 402(o)(2) and 303(d)(4) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require that effluent limitations in a reissued permit must be as stringent as those in the previous permit, with some exceptions in which limitations may be relaxed.

D. Impaired Water Bodies on CWA 303(d) List

In November 2006, the USEPA approved a revised list of impaired water bodies prepared by the State [the 303(d) list], prepared pursuant to provisions of CWA section 303(d), which requires identification of specific water bodies where it is expected that WQS will not be met after implementation of technology-based effluent limitations on point sources. Artesian Slough and Coyote Creek are not identified as impaired waterbodies; however, South San Francisco Bay is listed as an impaired waterbody for chlordane, DDT, dieldrin, dioxin compounds, exotic species, furan compounds, mercury, PCBs, and dioxin-like PCBs. The SIP requires final effluent limitations for all 303(d)-listed pollutants to be consistent with total maximum daily loads (TMDLs) and associated waste load allocations (WLAs).

The Regional Water Board plans to adopt TMDLs for pollutants on the 303(d) list in South San Francisco Bay within the next ten years (a TMDL for mercury became effective on February 12, 2008).

TMDLs will establish WLAs for point sources and load allocations (LAs) for non-point sources, and will be established to achieve the WQS for impaired waterbodies. The discharge of mercury from the Plant is regulated by the Regional Water Board Order No. R2-2007-0077, which implements the mercury TMDL and contains monitoring and reporting requirements.

IV. RATIONALE FOR EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

The CWA requires point source dischargers to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the United States. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. There are two principal bases for effluent limitations in 40 CFR: section 122.44(a) requires that permits include applicable technology-based limitations and standards; and section 122.44(d) requires that permits include water quality-based effluent limitations (WQBELs) to attain and maintain applicable numeric and narrative WQC to protect the beneficial uses of the receiving water. Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, WQBELs must be established.

Several specific factors affecting the development of limitations and requirements in this Order are discussed below:

A. Discharge Prohibitions

1. **Discharge Prohibitions III.A (No discharge other than that described in this Order):** This prohibition is the same as in the previous permit and is based on CWC section 13260, which requires filing a Report of Waste Discharge (ROWD) before discharges can occur. Discharges not described in the ROWD, and subsequently in this Order, are prohibited.

2. **Discharge Prohibition III.B (No bypass except under the conditions at 40 CFR 122.41(m)(4)(i)(A)(B)-(C)):** This prohibition is based on 40 CFR 122.41(m) (see Federal Standard Provisions, section G, Attachment D). This provision grants bypass around tertiary treatment of peak wet-weather flows above 250 MGD that are recombined with tertiary effluent prior to discharge at outfall 001 provided that (1) the discharge complies with the effluent and receiving water limitations contained in this Order, and (2) the Discharger operates the facility as designed and in accordance with the Operation & Maintenance Manual developed for the Plant. This means that the Discharger shall optimize storage and use of equalization units, and shall fully utilize the advanced treatment units. The Discharger submitted a No Feasible Alternative Analysis on November 6, 2008 demonstrating its compliance with 40 CFR 122.41 (m) for bypassing filters under extreme flow conditions.

3. **Discharge Prohibition III.C (The average dry weather influent flow shall not exceed 167 MGD):** Exceedance of the treatment plant's average dry weather flow design capacity may result in lowering the reliability of achieving compliance with water quality requirements. This prohibition is meant to ensure effective wastewater treatment by limiting flows to the Plant's design treatment capability. The average dry weather influent flow is determined during any five-weekday period during the months of June through October. This is based on the JPA Master Agreements, which define the term "Plant capacity" as "the Mean Peak Five Day Dry Weather Plant Treatment capacity". This is used as the basis for charging annual fees to tributary agencies. Counting a 5-day average is more reasonable because weekend flows are different, less influenced by industry and more dependent on residential discharge. Back in the 1950s through 1970s the major concern was the industrial fruit canneries and the canning season. Seasonal weekday cannery sewage strength and volume was the major consideration when the JPA Master Agreements were written. Even though flows and loads are different now, the 5-weekday calculation provides a better estimate of flows resulting from economic activity, and it is the standard that has been used for decades. Therefore, this determination method is retained in this Order.

   This Order contains a provision that requires actions to hold discharge flows to 120 MGD or levels necessary to protect endangered species habitat and a reopener clause in the event that flows exceed 120 MGD. The South Bay Action Plan calls for water conservation and water reclamation efforts. The Discharger completed the South Bay Action Plan on September 30, 1991, and the Regional Water Board accepted it through Resolution No. 91-152 in lieu of a 120 MGD average dry weather effluent flow (ADWEF) cap. The South Bay Action Plan is annually updated by the Discharger; however, if the Plant's ADWEF exceeds 120 MGD, pursuant to Regional Water Board Resolution No. 91-152, the Regional Water Board may hold a public hearing to consider adoption of a permit amendment imposing a discharge flow limit of 120 MGD. The ADWEF is the lowest average effluent flow for any three consecutive months between the months of May and October.

4. **Discharge Prohibition III.D (No sanitary sewer overflows to waters of the United States).** Discharge Prohibition No. 15 from Basin Plan Table 4-1 and the CWA prohibit the discharge of wastewater to surface waters except as authorized under an NPDES permit. POTWs must achieve secondary treatment, at a minimum, and any more stringent limitations that are necessary to achieve WQS [33 U.S.C. § 1311 (b)(1)(B and C)]. Therefore, a sanitary sewer overflow that results in the discharge of raw sewage, or sewage not meeting secondary treatment requirements, is prohibited under the CWA and the Basin Plan.

B. Exceptions to Basin Plan Prohibitions

Basin Plan Table 4-1 contains the following discharge prohibition (Prohibition 1):

> *1. Any wastewater which has particular characteristics of concern to beneficial uses at any point at which the wastewater does not receive a minimum initial dilution of at least 10:1, or into any nontidal water, dead-end slough, similar confined waters, or any immediate tributaries thereof.*

Basin Plan section 4.2 provides for exceptions to this prohibition in the following circumstances:

- An inordinate burden would be placed on the discharger relative to beneficial uses protected and an equivalent level of environmental protection can be achieved by alternate means, such as an alternative discharge site, a higher level of treatment, and/or improved treatment reliability; or
- A discharge is approved as part of a reclamation project; or
- It can be demonstrated that net environmental benefits will be derived as a result of the discharge; or
- A discharge is approved as part of a groundwater clean-up project....

The treated wastewater discharges from the San Jose/Santa Clara, Palo Alto, and Sunnyvale wastewater treatment plants are discharged to confined waters and do not receive a minimum initial dilution of 10:1. In 1973, these dischargers formed the South Bay Dischargers Authority to jointly consider relocating their outfalls to a location north of the Dumbarton Bridge, but instead, based on studies they conducted between 1981 through 1986, they concluded that their discharges provided a net environmental benefit.

At the same time, the Regional Water Board amended the Basin Plan to establish several new WQOs. Due to the unique hydrodynamic environment of the South Bay, however, the 1986 Basin Plan exempted the South Bay from the new WQOs, instead calling for the development of site-specific objectives (SSOs).

In 1988, the Regional Water Board reissued the Sunnyvale and Palo Alto permits (Order Nos. 88-176 and Order No. 88-175), concurring that these discharges provided a net environmental benefit. It therefore granted exceptions to the Basin Plan discharge prohibition provided that the dischargers would conduct studies addressing salt marsh conversion, development of SSOs and effluent limitations for metals, ammonia removal, and avian botulism control. However, the

Regional Water Board concluded that discharges from the San Jose/Santa Clara wastewater treatment plant did not provide a net environmental benefit, citing that the discharge was converting extensive salt marsh habitat to a brackish and freshwater marsh. Nevertheless, the Regional Water Board found that the discharge could provide a net environmental benefit if the Discharger were to mitigate the loss of salt marsh habitat. The Regional Water Board issued a Cease and Desist Order (CDO, Order No. 89-013) in 1989 requiring compliance with the Basin Plan prohibition or mitigation for the loss of salt marsh habitat. The Regional Water Board concurrently reissued the NPDES permit (Order No. 89-012) for the San Jose/Santa Clara facility.

Interested parties objected to all three permits and petitioned the State Water Board for review. The State Water Board responded in 1990 through Order No. WQ 90-5. It concluded that all three dischargers had failed to demonstrate a net environmental benefit. Specifically, nutrient loading in South San Francisco Bay was a problem, avian botulism was harming wildlife and estuarine habitat, and metals discharges were potentially contributing to San Francisco Bay impairment. In addition, San Jose/Santa Clara discharges in particular had a substantial adverse impact on rare and endangered species as a result of the loss of salt marsh habitat.

Through Order No. WQ 90-5, the State Water Board acknowledged that relocation of the discharges north of the Dumbarton Bridge was not economically or environmentally sound. The State Water Board "strongly encouraged" the Regional Water Board and the South Bay Dischargers Authority to pursue wastewater reclamation projects as a means to reduce discharges to San Francisco Bay, and it also concluded that exceptions to the Basin Plan discharge prohibitions could be granted on the basis of "equivalent protection" (i.e., protection equivalent to relocating the discharges to a location north of the Dumbarton Bridge), provided that certain conditions were met. It stated that exceptions could be granted if (a) the discharge permits were to include numeric WQBELs for toxic pollutants, (b) the dischargers were to continue efforts to control avian botulism; and (c) the dischargers were to properly protect threatened and endangered species. For the San Jose/Santa Clara discharge, the State Water Board determined protection of threatened and endangered species could be accomplished by limiting average dry weather flows discharged to San Francisco Bay to no more than 120 MGD (or to flows that would not further harm rare or endangered species) and by creating or restoring 380 acres of wetlands.

The Discharger has been required to comply with the State Water Board's Order No. WQ 90-5 to qualify for an exception from the Basin Plan discharge prohibition. The following is a summary of the Discharger's past and on-going efforts:

(1) **Avian Boutlism Monitoring and Control.** Annual avian botulism monitoring reports submitted by both the San Jose/Santa Clara and Sunnyvale wastewater treatment plants show that the most recent botulism outbreak in the South Bay occurred in September 2004. Without question, the South Bay ecosystem is susceptible to avian botulism outbreaks. However, when considering the constant wastewater discharge from wastewater treatment plants, the cause of these episodic outbreaks seems to lie with other environmental factors. While treatment plant discharge is unlikely to cause botulism outbreaks, monitoring for and removing dead birds to minimize the potential for an outbreak is an appropriate environmental stewardship program to control the severity and extent of the disease. Because waterfowl are a highly mobile group of birds and are most heavily affected by avian botulism, outbreaks could quickly spread throughout the region if no action were taken. For these

reasons, the Discharger believes that continuing the program of monitoring for and collecting dead and injured birds on Plant property and areas along Artesian Slough, Alviso Slough and portions of Coyote Creek is a worthwhile public endeavor. This Order requires the Discharger to maintain its avian botulism program.

(2) **Heavy Metals Discharge.** Concentrations of heavy metals in the Plant effluent have met all applicable water quality-based effluent limits for over a decade. With the exception of ambient mercury levels, there is no reasonable potential to exceed WQOs for these metals based on Plant discharge and ambient concentrations. The Discharger will maintain its current performance and monitoring program for both effluent and receiving water to ensure that no degradation will occur.

(3) **Nutrients Discharge.** Discharges of nutrients from the Plant have decreased significantly since 1990. From 1990 to 2005, annual average Plant discharges of nitrate and ammonia nitrogen have decreased 50% and 75%. Nitrogen mass loadings (nitrate + ammonia) decreased from 7,847 kg/day in 1990 to 4,066 kg/day in 2005. Plant phosphate concentrations and loadings also decreased by over 75% between 1990 and 2005. RMP monitoring results from 1994 to 2006 have also demonstrated that concentrations of ammonia, nitrate, and nitrite have decreased in San Francisco Bay. This Order retains the previous ammonia effluent limits to ensure current Plant performance will be maintained.

(4) **Water Recycling.** Since the mid-1990's, the City of San Jose, with assistance through various loans, grants and subsidies from other agencies, has funded the construction of facilities to reclaim and recycle a significant portion of the Plant effluent flow. The initial investment in the 1990s amounted to $140 million to construct 60 miles of pipeline, two pump stations, and one 4-million-gallon reservoir. A new South Bay Water Recycling (SBWR) organization within the City of San Jose was created to operate and maintain the system. Since 2001, the City has completed an $82.5 million Phase 2 expansion project.

As of June 2008, the SBWR system provides more than 10,300 acre-feet of water to over 550 customers through more than 105 miles of pipeline, 3 reservoirs with a combined 9.5-million-gallons of storage, and 4 pump stations. Since its construction in 1997, over 22 billion gallons of recycled water have been delivered to customers in San Jose, Santa Clara and Milpitas. Recycled water use has resulted in lower Plant discharges to the Bay.

(5) **Wetland Mitigation and Endangered Species Protection.** As of 2004, the City of San Jose had met all wetland mitigation requirements. Specifically, in December 2003, the City executed an agreement with the agencies and provided $650,000 to the Peninsula Open Space Trust to assist in Bair Island restoration. As a result of this agreement, the City is no longer required to restore the Moseley Tract and has met all wetland mitigation requirements.

Furthermore, in its 2007 marsh assessment study, the City for the first time saw a large-scale conversion of brackish marsh to salt marsh. This increased the preferred habitat for the endangered California clapper rail and salt marsh harvest mouse. Plant discharges do not appear to cause significant changes in species distribution in the South Bay relative to the inter-annual variation in numerous other contributing factors (e.g., salt pond restoration, sea level change, Delta outflow).

In summary, the Discharger has complied with all of the State Water Board Order No. WQ 90-5 related Provisions contained in the previous Order. The Discharger continues to implement and annually report on all the activities required to be conducted pursuant to the South Bay Action Plan. The Discharger has continued to conduct an annual avian botulism monitoring and management program. The Discharger has collected effluent and receiving water data demonstrating the absence of impairment due to the discharge of nutrients or metals. Based on currently available information, the Discharger appears to have met all of the historically identified requirements of both the State and Regional Water Boards for obtaining an exception to the Basin Plan prohibitions based on a finding of equivalent protection. The Regional Water Board therefore, grants an exception to Basin Plan discharge prohibition 1 (Table 4-1) on the basis of equivalent protection. Attachment I provides a chronological description of the actions taken by the State and Regional Water Boards, the City of San Jose, and the City of Santa Clara related to the requirements of Order No. 90-5. The summary also clarifies the origin of some provisions that appear in this Order.

C. Effluent Limitations for Conventional and Non-Conventional Pollutants

1. Scope and Authority of Technology-Based Effluent Limitations

CWA section 301(b) and 40 CFR 122.44 require that permits include conditions meeting applicable technology-based requirements at a minimum, and any more stringent effluent limitations necessary to meet applicable WQS. The discharge authorized by this Order must meet minimum federal technology-based requirements based on Secondary Treatment Standards at 40 CFR 133. These Secondary Treatment Regulations include the following minimum requirements for POTWs.

Table F-7. Secondary Treatment Requirements

Parameters	30-Day Average	7-Day Average
BOD_5 [1]	30 mg/L	45 mg/L
$CBOD_5$ [1][2]	25 mg/L	40 mg/L
TSS [1]	30 mg/L	45 mg/L
pH	6.0 – 9.0	

Footnotes for Table F-7:

(1) The 30-day average percent removal, by concentration, shall not be less than 85 percent.

(2) At the option of the permitting authority, these effluent limitations for $CBOD_5$ may be substituted for limitations for BOD_5.

San Francisco Bay south of the Dumbarton Bridge is a unique water body, with a limited capacity to assimilate wastewater. Due to limited circulation, wastewater discharges to this area may take several months to reach the ocean. In addition, the unique wetlands and ambient conditions of South San Francisco Bay sometimes result in natural dissolved oxygen levels that are lower than the Basin Plan's receiving water limit of a minimum of 5.0 mg/L. The limited assimilative capacity of South San Francisco Bay necessitates effluent BOD and TSS limitations that are more restrictive than those required for secondary treatment.

The Discharger constructed advanced waste treatment facilities in the late 1970's and has consistently met limits on conventional pollutants that are more stringent than the secondary treatment standards. These effluent limits represent the best performance the existing

facilities can reliably achieve so as to help meet the Basin Plan's WQOs for dissolved oxygen.

2. Applicable Effluent Limitations

This Order retains the following effluent limitations for conventional and non-conventional pollutants, applicable to Discharge Point 001, from the previous Order.

Table F-8. Summary of Effluent Limitations for Conventional and Non-Conventional Pollutants

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
$CBOD_5$	mg/L	10	---	20	---	---
TSS	mg/L	10	---	20	---	---
$CBOD_5$ and TSS	%	85	---	---	---	---
Oil and Grease	mg/L	5	---	10	---	---
pH	s.u.	---	---	---	6.5	8.5
Total Chlorine Residual	mg/L	---	---	---	---	0.0[1]
Turbidity	NTU	---	---	---	---	10
Total Ammonia	mg/L as nitrogen	3	---	8	---	---
Enterococcus Bacteria	Colonies/ 100 mL	35[2]	---	---	---	---

Footnotes for Table F-8:

(1) Requirement defined as below the limit of detection in standard test methods defined in the latest USEPA approved edition of Standard Methods for the Examination of Water and Wastewater. The Discharger may elect to use a continuous on-line monitoring system for measuring flow, chlorine, and sodium bisulfite dosage (including a safety factor) and concentration to prove that chlorine residual exceedances are false positives. Convincing evidence must be provided to Regional Water Board staff to conclude these false positive exceedances are not violations of this permit.

(2) Expressed as a 30-day geometric mean.

This Order does not retain the previous Order's technology-based effluent limitations for settleable matter because Basin Plan Table 4-2 no longer requires them for POTWs.

a. $CBOD_5$ and TSS. The effluent limitations for $CBOD_5$ and TSS, including the 85% removal requirement are unchanged from the previous Order. These limitations are technologically feasible to meet by the advanced wastewater treatment technologies the Plant uses. 40 CFR 122.45(d) specifies that discharge limitations for POTWs shall be stated as average weekly limitations and average monthly limitations, unless impracticable. Expressing effluent limitations for $CBOD_5$ and TSS as maximum daily limitations instead of average weekly limitations results in more stringent limits, as effluent variability is not averaged out over a period of a week. Self-monitoring data show the Discharger has been able to consistently comply with these $CBOD_5$ and TSS effluent limits.

b. **Oil and Grease.** The effluent limitations for oil and grease are technology-based and are unchanged from the previous Order. These limitations are based on Basin Plan Table 4-2 for shallow water dischargers. Self-monitoring data show the Discharger has been able to consistently comply with these oil and grease effluent limits.

c. **pH.** The effluent limitations for pH are water quality-based and are unchanged from the previous Order. These limitations are based on Basin Plan Table 4-2 for shallow water dischargers. Self-monitoring data show the Discharger has been able to consistently comply with these pH effluent limits.

d. **Total chlorine residual.** The effluent limitation for total chlorine residual is water-quality-based and is based on Basin Plan Table 4-2 and is unchanged from the previous Order. The Discharger may use a continuous on-line monitoring system to measure flow, chlorine, and sodium bisulfite concentration and dosage to prove that chlorine residual exceedances are false positives. If convincing evidence is provided, Regional Water Board staff may conclude that these false positives of chlorine residual exceedances are not violations of the limitation.

   The Discharger will need to report the maximum residual chlorine concentration observed following dechlorination on a daily basis unless the Discharger requests to use the chlorine residual reporting strategy as allowed in the Regional Water Board's October 19, 2004, letter and the Discharger complies with the conditions listed in the letter as detailed below. The Discharger may evaluate compliance with this effluent limit by recording discrete readings from continuous monitoring equipment every hour on the hour or by collecting grab samples every hour, for a total of 24 readings or samples per day, if the following conditions are met: (1) The Discharger shall retain continuous monitoring readings for at least three years; (2) The Discharger shall acknowledge in writing that Regional Water Board reserves the right to use all other continuous monitoring data for discretionary enforcement; (3) The Discharger must provide in writing the brand name(s), model number(s), and serial number(s) of the equipment used to continuously monitor dechlorinated final effluent chlorine residual. If the identified equipment is replaced, the Discharger shall provide the Regional Water Board in writing, within 72 hours of the successful startup of the new equipment, the new equipment's brand name, model number, and serial number. The written notification identified in items 1 through 3 shall be in the form of a letter addressed to the Regional Water Board's Executive Officer with a certification statement as listed in the October 19, 2004, Regional Water Board letter re: Chlorine Compliance Strategy for Dischargers Using Continuous Monitoring Devices.

   Effluent data show the Discharger can comply with this effluent limit. Self-monitoring data show the Discharger has been able to consistently comply with the total chlorine residual effluent limit.

e. **Turbidity.** The effluent limitation for turbidity is unchanged from the previous Order and is representative of adequate and reliable tertiary level wastewater treatment. This limitation is technologically feasible to meet by the advanced wastewater treatment technologies the plant uses. Self-monitoring data show the Discharger has been able to consistently comply with this turbidity effluent limit.

f. **Total Ammonia.** These effluent limits are retained from the previous Order. They were originally included in Order No. 89-012 based on treatment plant performance. These effluent limits are retained to ensure that the Discharger maintains its Plant's nitrification performance.

g. **Enterococcus bacteria.** The effluent limitation for enterococcus bacteria are unchanged from the previous Order, except the single sample maximum limit of 276 colonies per 100 mL is not retained to be consistent with other recently adopted NPDES permits and USEPA criteria. Basin Plan Table 3-2 cites the 30-day geometric mean enterococcus bacteria limit, which is consistent with the USEPA criteria at 40 CFR 131.41 for coastal recreational waters, including costal estuaries, in California. These water quality criteria became effective on December 16, 2004 [69 Fed. Register 67218 (November 16, 2006)].

Although USEPA also established single sample maximum criteria for enterococci bacteria, this Order implements only the geometric mean criterion of 35 colonies per 100 milliliters as an effluent limitation because the single sample maximum limit is unnecessary (see Table F-3). Also, when these water quality criteria were promulgated, USEPA expected that the single sample maximum values would be used for making beach notification and beach closure decisions. "Other than in the beach notification and closure decision context, the geometric mean is the more relevant value for assuring that appropriate actions are taken to protect and improve water quality because it is a more reliable measure, being less subject to random variation ..." [69 Fed Reg. 67224 (November 16, 2004)].

The removal of the daily maximum bacteria limit is consistent with the exception to the Clean Water Act's backsliding provisions, expressed at CWA 402(o)(2)(B)(ii) for technical mistakes.

The Discharger has previously conducted a study, in August and September 2002 (prior to adoption of the previous Order), demonstrating that effluent limitations for enterococcus bacteria are also protective of beneficial uses of the receiving water. Shellfish harvesting is not a use designated in the Basin Plan for the receiving water, and the Discharger indicates that shellfish harvesting does not occur in the vicinity of the discharge.

Self-monitoring data show the Discharger has been able to consistently comply with this enterococcus 30-day geometric mean effluent limit.

D. WQBELs

WQBELs have been derived to implement WQOs that protect beneficial uses. Both the beneficial uses and the WQOs have been approved pursuant to federal law. The procedures for calculating individual WQBELs are based on the SIP, which was approved by the USEPA prior to May 1, 2001, or Basin Plan provisions approved by the USEPA on May 29, 2000. Most beneficial uses and WQOs contained in the Basin Plan were approved under state law and submitted to and approved by the USEPA prior to May 30, 2000. Any WQOs and beneficial uses submitted to the USEPA prior to May 30, 2000, but not approved by the USEPA before that date, are nonetheless "applicable water quality standards for purposes of the [Clean Water] Act"

pursuant to 40 CFR 131.21(c)(1). Collectively, this Order's restrictions on individual pollutants are no more stringent than the applicable WQS for purposes of the CWA.

1. Scope and Authority

a. 40 CFR 122.44(d)(1)(i) mandates that permits include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a WQS, including numeric and narrative objectives within a standard. As specified in 40 CFR 122.44(d)(1)(i), permits are required to include WQBELs for all pollutants "which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard." Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, WQBELs must be established using (1) USEPA criteria guidance under CWA section 304(a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric WQC, such as a proposed state criterion or policy interpreting the state's narrative criterion, supplemented with other relevant information, as provided in section 122.44(d)(1)(vi).

The process for determining "reasonable potential" and calculating WQBELs when necessary is intended to protect the designated uses of the receiving water as specified in the Basin Plan, and achieve applicable WQOs/WQC that are contained in other state plans and policies, and applicable WQC contained in the CTR and NTR.

b. NPDES regulations and the SIP provide the basis to establish maximum daily effluent limitations (MDELs).

(1) **NPDES Regulations.** NPDES regulations at 40 CFR 122.45(d) state: "For continuous discharges all permit effluent limitations, standards, and prohibitions, including those necessary to achieve water quality standards, shall *unless impracticable* be stated as maximum daily and average monthly discharge limitations for all discharges other than publicly owned treatment works."

(2) **SIP.** The SIP (Section 1.4) requires WQBELs to be expressed as MDELs and average monthly effluent limitations (AMELs).

c. MDELs are used in this Order to protect against acute water quality effects. The MDELs are necessary for preventing fish kills or mortality to aquatic organisms.

2. Applicable Beneficial Uses and WQC

The WQC applicable to the receiving waters for this discharge are from the Basin Plan; the CTR, established by USEPA at 40 CFR 131.38; and the NTR, established by USEPA at 40 CFR 131.36. Some pollutants have WQC established by more than one of these three sources.

a. **Basin Plan.** The Basin Plan specifies numeric WQOs for 10 priority toxic pollutants, for all marine and freshwaters *except for* South San Francisco Bay, south of Dumbarton

Bridge. For this portion of South Bay, the CTR WQC apply, except SSOs have been adopted for copper and nickel for marine and estuarine waters of South San Francisco Bay, south of Dumbarton Bridge. SSOs for cyanide have been adopted for all segments of San Francisco Bay.

b. **CTR.** The CTR specifies numeric aquatic life criteria for 23 priority toxic pollutants and numeric human health criteria for 57 priority toxic pollutants. These criteria apply to all inland surface waters and enclosed bays and estuaries of the San Francisco Bay Region, including South San Francisco Bay south of the Dumbarton Bridge.

c. **NTR.** The NTR establishes numeric aquatic life criteria for selenium and numeric human health criteria for 33 toxic organic pollutants for waters of San Francisco Bay upstream to, and including Suisun Bay and the Delta. These NTR WQC are applicable to South San Francisco Bay.

d. **Narrative Objectives for Water Quality-Based Toxics Controls.** Where numeric objectives have not been established or updated in the Basin Plan, NPDES regulations at 40 CFR 122.44(d) require that WQBELs be established based on USEPA criteria, supplemented where necessary by other relevant information, to attain and maintain narrative WQOs to fully protect designated beneficial uses.

To determine the need for and establish WQBELs, when necessary, the Regional Water Board staff has followed the requirements of applicable NPDES regulations, including 40 CFR 122 and 131, as well as guidance and requirements established by the Basin Plan; USEPA's Technical Support *Document for Water Quality-Based Toxics Control* (the TSD, EPA/505/2-90-001, 1991); and the SIP.

e. **Basin Plan Receiving Water Salinity Policy.** The Basin Plan and CTR state that the salinity characteristics (i.e., freshwater versus saltwater) of the receiving water shall be considered in determining the applicable WQOs. Freshwater criteria shall apply to discharges to waters with salinities equal to or less than 1 ppt at least 95 percent of the time. Saltwater criteria shall apply to discharges to waters with salinities equal to or greater than 10 ppt at least 95 percent of the time in a normal water year. For discharges to waters with salinities in between these two categories, or tidally influenced fresh waters that support estuarine beneficial uses, the WQOs shall be the lower of the salt- or freshwater criteria (the freshwater criteria for some metals are calculated based on ambient hardness) for each substance.

The receiving water for this discharge is Artesian Slough which ultimately flows into South San Francisco Bay via Coyote Creek. Salinity data are not available for Artesian Slough or Coyote Creek; however, salinity as measured at the Regional Monitoring Program (RMP) San Jose Slough station (C-3-0) indicates an estuarine environment (73 percent of the salinity data fell between 1 and 10 ppt). Artesian Slough and Coyote Creek are tidally influenced and are therefore considered estuarine receiving waters. The lower of the marine and freshwater WQOs from the Basin Plan, NTR, and CTR apply to this discharge.

f. **Receiving Water Hardness.** Ambient hardness values are used to calculate freshwater WQOs that are hardness dependent. In determining the WQOs for this Order, Regional

Water Board staff used a hardness value of 400 mg/L as $CaCO_3$. The minimum hardness value observed at RMP station C-3-0 is 510 mg/L. USEPA guidance in the CTR [40 CFR 131.38(c)(4)] states that when the ambient hardness exceeds 400 mg/L as $CaCO_3$, a value of 400 mg/L shall be used in calculating hardness-based criteria.

g. **Site-Specific Translators.** 40 CFR 122.45(c) requires that effluent limitations for metals be expressed as total recoverable metal. Since applicable WQC for metals are typically expressed as dissolved metal, factors or translators must be used to convert metals concentrations from dissolved to total recoverable and vice versa. The CTR includes default conversion factors that are used in NPDES permitting activities; however, site-specific conditions, such as water temperature, pH, suspended solids, and organic carbon, greatly impact the form of metal (dissolved, filterable, or otherwise) that is present in the water and therefore available to cause toxicity. In general, the dissolved form of the metals is more available and more toxic to aquatic life than the filterable forms. Site-specific translators can be developed to account for site-specific conditions, thereby preventing exceedingly stringent or under protective WQOs.

Site-specific translators for copper and nickel were developed for South San Francisco Bay and are in the Basin Plan. The site-specific translators for copper and nickel are presented in Table F-9.

For this permit reissuance, Regional Water Board staff developed site-specific translators for chromium (VI), zinc, and lead for the South San Francisco Bay using data from the Dumbarton Bridge RMP station (BA30), and following USEPA's recommended guidelines for translator development. These translators were applied in determining reasonable potential and/or effluent limitations for these constituents. These translators were updated using additional RMP data collected since the previous permit. The newly calculated translators for Zn, Cr(VI), and Pb are also presented in Table F-9, below. In determining the need for and calculating WQBELs for all other metals, where appropriate, Regional Water Board staff used default conversion factors in the CTR, Table 2.

Table F-9. Site-specific translators for Cu, Ni, Zn, Cr(VI), and Pb for South San Francisco Bay

Pollutant	AMEL Translator	MDEL Translator
Copper	0.53	0.53
Nickel	0.44	0.44
Zinc	0.24	0.56
Chromium (VI)	0.037	0.089
Lead	0.060	0.15

3. Determining the Need for WQBELs

Assessing whether a pollutant has Reasonable Potential is the fundamental step in determining whether or not a WQBEL is required. Using the methods prescribed in section 1.3 of the SIP, Regional Water Board staff analyzed the effluent data to determine if the discharge demonstrates Reasonable Potential. The Reasonable Potential Analysis (RPA)

compares the effluent data with numeric and narrative WQOs in the Basin Plan, the NTR, and the CTR.

a. **Reasonable Potential Methodology.** The RPA identifies the observed MEC in the effluent for each pollutant based on effluent concentration data. There are three triggers in determining Reasonable Potential according to Section 1.3 of the SIP.

(1) The first trigger (Trigger 1) is activated if the MEC is greater than or equal to the lowest applicable WQC (MEC ≥ WQC), which has been adjusted, if appropriate, for pH, hardness, and translator data. If the MEC is greater than or equal to the adjusted WQC, then that pollutant has Reasonable Potential, and a WQBEL is required.

(2) The second trigger (Trigger 2) is activated if the observed maximum ambient background concentration (B) is greater than the adjusted WQC (B > WQC), and the pollutant is detected in any of the effluent samples.

(3) The third trigger (Trigger 3) is activated if a review of other information determines that a WQBEL is required to protect beneficial uses, even though both MEC and B are less than the WQC.

b. **Effluent Data.** The Regional Water Board's August 6, 2001, letter titled *Requirement for Monitoring of Pollutants in Effluent and Receiving Water to Implement New Statewide Regulations and Policy* (hereinafter referred to as the August 6, 2001, Letter, Attachment G), formally required the Discharger to initiate or continue monitoring for the priority pollutants using analytical methods that provide the best detection limits reasonably feasible. Regional Water Board staff analyzed these effluent data and the nature of the discharge to determine if the discharge has Reasonable Potential. The RPA was based on the effluent monitoring data collected by the Discharger from February 2005 through January 2008 for most inorganic pollutants, and from November 2003 through January 2008 for most organic pollutants.

c. **Ambient Background Data.** Ambient background values are typically used to determine reasonable potential and to calculate effluent limitations, when necessary. For the RPA, ambient background concentrations are the observed maximum detected water column concentrations. The SIP states that, for calculating WQBELs, ambient background concentrations are either the observed maximum ambient water column concentrations or, for criteria intended to protect human health from carcinogenic effects, the arithmetic mean of observed ambient water concentrations.

The background data used in the RPA were generated at the Dumbarton Bridge RMP station, except for ammonia, for which the maximum ambient concentration at the San Jose Slough RMP station was used.

Not all the constituents listed in the CTR have been analyzed by the RMP. These data gaps are addressed by the Regional Water Board's August 6, 2001, Letter, which formally required dischargers to conduct ambient background monitoring and effluent monitoring for those constituents not currently monitored by the RMP and to provide this technical information to the Regional Water Board.

On May 15, 2003, a group of several San Francisco Bay Region Dischargers (known as the Bay Area Clean Water Agencies, or BACWA) submitted a collaborative receiving water study, entitled the San Francisco Bay Ambient Water Monitoring Interim Report (2003). This study includes monitoring results from sampling events in 2002 and 2003 for the remaining priority pollutants not monitored by the RMP. The study included the Dumbarton Bridge monitoring station. Additional data were provided from the BACWA Ambient Water Monitoring: Final CTR Sampling Update Report, dated June 15, 2004.

The RPA was conducted and the WQBELs were calculated using RMP data from 1993 through 2006 at the Dumbarton Bridge RMP station, and additional data from the BACWA receiving water study.

d. **Total Ammonia Objectives.** The Basin Plan contains WQOs for un-ionized ammonia of 0.025 milligrams per liter (mg/L) as an annual median and 0.4 mg/L as a maximum for Lower San Francisco Bay. Regional Water Board staff translated these WQOs from un-ionized ammonia concentrations to equivalent total ammonia concentrations (as nitrogen) since (1) sampling and laboratory methods are not available to analyze for un-ionized ammonia; and (2) the fraction of total ammonia that exists in the toxic un-ionized form depends on the pH, salinity, and temperature of the receiving water. To translate the Basin Plan un-ionized ammonia objective, Regional Water Board staff used pH, salinity, and temperature data from 1994 through 2002 from the nearest RMP station to the outfall, the San Jose Slough station (C-3-0). Regional Water Board staff used the following equations to determine the fraction of total ammonia that would exist in the toxic un-ionized form in the estuarine receiving water. [*Ambient Water Quality Criteria for Ammonia* (saltwater) – 1989, EPA Publication 440/5-88-004, USEPA, 1989]:

For salinity > 10 ppt: fraction of $NH_3 = \frac{1}{1+10^{(pK-pH)}}$

Where:

pK = 9.245 + 0.116*(I) + 0.0324*(298-T) + 0.0415*(P)/T
I = the molal ionic strength of saltwater = 19.9273*(S)/(1000-1.005109*S)
S = Salinity (parts per thousand)
T = temperature in degrees Celsius
P = Pressure (one atmosphere)

To convert the Basin Plan's chronic un-ionized ammonia WQO to an equivalent total ammonia concentration, the median un-ionized ammonia fraction at the San Jose Slough monitoring station was used. To convert the Basin Plan's acute un-ionized ammonia WQO to an equivalent total ammonia concentration, the 90th percentile un-ionized ammonia fraction at the San Jose Slough RMP station (C-3-0 and SB04) was used. Using the 90th percentile and median to express the acute and chronic un-ionized ammonia WQOs as equivalent total ammonia concentrations is consistent with USEPA guidance, as expressed by USEPA in The Metals Translator: Guidance for Calculating a Total Recoverable Limit from a Dissolved Criterion (EPA Publication Number 823-B-96-007, 1996). The equivalent total ammonia acute and chronic WQOs are 12.6 mg/L and 1.7 mg/L, respectively.

e. **RPA Determination.** The MECs, most stringent applicable WQC, and background concentrations used in the RPA are presented in Table F-10, along with the RPA results (yes or no) for each pollutant. Reasonable Potential was not determined for all pollutants because there are not applicable WQC for all pollutants, or monitoring data were not available for others. The RPA determines that cyanide, tributyltin, dioxin-TEQ, and heptachlor exhibit Reasonable Potential by Trigger 1. Mercury exhibits reasonable potential by Trigger 2. Copper and nickel have reasonable potential by Trigger 3 as explained below under specific basis for each pollutant.

Table F-10. Summary of RPA Results

CTR #	Priority Pollutants	MEC or Minimum DL[1,2] (µg/L)	Governing WQC (µg/L)	Maximum Background or Minimum DL[1,2] (µg/L)	RPA Results[3]
1	Antimony	0.81	4300	1.3	No
2	Arsenic	2.3	36	5.1	No
3	Beryllium	2.3	No Criteria	0.11	No
4	Cadmium	0.23	7.3	0.17	No
5a	Chromium (III)	3.0	644	14.7	No
5b	Chromium (VI)	3.0	200	15	No
6	**Copper**	**9.5**	**13**	**8.6**	**Yes**
7	Lead	1.4	116	4.2	No
8	**Mercury (303 d listed)**	**0.02**	**0.051**	**0.068**	**Yes**
9	**Nickel**	**12**	**27**	**16**	**Yes**
10	Selenium (303 d listed)	1.2	5	0.63	No
11	Silver	0.12	2.2	0.12	No
12	Thallium	0.74	6.3	0.16	No
13	Zinc	69	170	21	No
14	**Cyanide**	**31**	**1.0**	**< 0.4**	**Yes**
15	Asbestos	Not Available	No Criteria	Not Available	No
16	2,3,7,8-TCDD	< 1.3E-07	1.4E-08	2.4E-08	No
	Dioxin TEQ (303 d listed)	**1.9E-08**	**1.4E-08**	**2.6E-07**	**Yes**
17	Acrolein	< 0.5	780	< 0.5	No
18	Acrylonitrile	< 0.33	0.66	< 0.02	No
19	Benzene	< 0.03	71	< 0.05	No
20	Bromoform	0.5	360	< 0.5	No
21	Carbon Tetrachloride	< 0.04	4.4	0.07	No
22	Chlorobenzene	< 0.03	21000	< 0.5	No
23	Chlorodibromomethane	4	34	0.057	No
24	Chloroethane	< 0.03	No Criteria	<0.5	No
25	2-Chloroethylvinyl Ether	< 0.1	No Criteria	< 0.5	No
26	Chloroform	7.1	No Criteria	< 0.5	No
27	Dichlorobromomethane	6	46	< 0.05	No
28	1,1-Dichloroethane	< 0.04	No Criteria	< 0.05	No
29	1,2-Dichloroethane	< 0.04	99	0.04	No
30	1,1-Dichloroethylene	< 0.06	3.2	< 0.5	No
31	1,2-Dichloropropane	< 0.03	39	< 0.05	No
32	1,3-Dichloropropylene	< 0.03	1700	Not Available	No
33	Ethylbenzene	< 0.04	29000	< 0.5	No
34	Methyl Bromide	< 0.05	4000	< 0.5	No
35	Methyl Chloride	< 0.04	No Criteria	< 0.5	No
36	Methylene Chloride	0.8	1600	< 0.5	No
37	1,1,2,2-Tetrachloroethane	< 0.04	11	< 0.05	No
38	Tetrachloroethylene	< 0.04	8.9	< 0.05	No
39	Toluene	0.6	200000	< 0.3	No
40	1,2-Trans-Dichloroethylene	< 0.05	140000	< 0.5	No

CTR #	Priority Pollutants	MEC or Minimum DL[1,2] (µg/L)	Governing WQC (µg/L)	Maximum Background or Minimum DL[1,2] (µg/L)	RPA Results[3]
41	1,1,1-Trichloroethane	< 0.03	No Criteria	< 0.5	No
42	1,1,2-Trichloroethane	< 0.05	42	< 0.05	No
43	Trichloroethylene	< 0.05	81	< 0.5	No
44	Vinyl Chloride	< 0.05	525	< 0.5	No
45	Chlorophenol	< 0.21	400	< 1.2	No
46	2,4-Dichlorophenol	< 0.18	790	< 1.5	No
47	2,4-Dimethylphenol	< 0.14	2300	< 1.3	No
48	2-Methyl-4,6-Dinitrophenol	< 0.6	765	< 1.2	No
49	2,4-Dinitrophenol	< 0.6	14000	< 0.7	No
50	2-Nitrophenol	< 0.17	No Criteria	< 1.3	No
51	4-Nitrophenol	< 0.31	No Criteria	< 1.6	No
52	3-Methyl-4-Chlorophenol	< 0.17	No Criteria	< 1.1	No
53	Pentachlorophenol	< 0.15	7.9	< 1	No
54	Phenol	< 0.27	4600000	< 1.3	No
55	2,4,6-Trichlorophenol	< 0.16	6.5	< 1.3	No
56	Acenaphthene	< 0.03	2700	0.0026	No
57	Acenephthylene	< 0.02	No Criteria	0.0026	No
58	Anthracene	< 0.01	110000	0.0023	No
59	Benzidine	< 1	0.00054	< 0.0015	No
60	Benzo(a)Anthracene	< 0.01	0.049	0.011	No
61	Benzo(a)Pyrene	< 0.01	0.049	0.045	No
62	Benzo(b)Fluoranthene	< 0.02	0.049	0.057	No
63	Benzo(ghi)Perylene	< 0.02	No Criteria	0.015	No
64	Benzo(k)Fluoranthene	< 0.02	0.049	0.021	No
65	Bis(2-Chloroethoxy)Methane	< 0.14	No Criteria	< 0.3	No
66	Bis(2-Chloroethyl)Ether	< 0.16	1.4	< 0.32	No
67	Bis(2-Chloroisopropyl)Ether	< 0.17	170000	Not Available	No
68	Bis(2-Ethylhexyl)Phthalate	2	5.9	0.93	No
69	4-Bromophenyl Phenyl Ether	< 0.11	No Criteria	< 0.23	No
70	Butylbenzyl Phthalate	< 0.14	5200	0.0055	No
71	2-Chloronaphthalene	< 0.17	4300	< 0.3	No
72	4-Chlorophenyl Phenyl Ether	< 0.16	No Criteria	< 0.31	No
73	Chrysene	< 0.02	0.049	0.022	No
74	Dibenzo(a,h)Anthracene	< 0.02	0.049	0.0088	No
75	1,2-Dichlorobenzene	< 0.03	17000	< 0.3	No
76	1,3-Dichlorobenzene	< 0.03	2600	< 0.3	No
77	1,4-Dichlorobenzene	0.7	2600	< 0.3	No
78	3,3-Dichlorobenzidine	< 0.18	0.077	< 0.001	No
79	Diethyl Phthalate	< 0.34	120000	0.3	No
80	Dimethyl Phthalate	< 0.045	2900000	< 0.21	No
81	Di-n-Butyl Phthalate	< 0.32	12000	2.2	No
82	2,4-Dinitrotoluene	< 0.08	9.1	< 0.27	No
83	2,6-Dinitrotoluene	< 0.1	No Criteria	< 0.29	No
84	Di-n-Octyl Phthalate	< 0.15	No Criteria	< 0.38	No
85	1,2-Diphenylhydrazine	< 0.13	0.54	0.0053	No
86	Fluoranthene	< 0.02	370	0.039	No
87	Fluorene	< 0.02	14000	0.0055	No
88	Hexachlorobenzene	< 0.1	0.00077	0.00048	No
89	Hexachlorobutadiene	< 0.18	50	< 0.3	No
90	Hexachlorocyclopentadiene	< 0.06	17000	< 0.3	No
91	Hexachloroethane	< 0.16	8.9	< 0.2	No
92	Indeno(1,2,3-cd) Pyrene	< 0.02	0.049	0.078	No
93	Isophorone	< 0.15	600	< 0.3	No
94	Naphthalene	< 0.02	No Criteria	0.011	No

CTR #	Priority Pollutants	MEC or Minimum DL[1,2] (µg/L)	Governing WQC (µg/L)	Maximum Background or Minimum DL[1,2] (µg/L)	RPA Results[3]
95	Nitrobenzene	< 0.17	1900	< 0.25	No
96	N-Nitrosodimethylamine	< 0.18	8.1	< 0.3	No
97	N-Nitrosodi-n-Propylamine	< 0.17	1.4	< 0.001	No
98	N-Nitrosodiphenylamine	< 0.15	16	< 0.2	No
99	Phenanthrene	< 0.02	No Criteria	0.014	No
100	Pyrene	< 0.017	11000	0.056	No
101	1,2,4-Trichlorobenzene	< 0.17	No Criteria	< 0.3	No
102	Aldrin	< 0.0014	0.00014	1.37E-6	No
103	alpha-BHC	0.0046	0.013	0.00066	No
104	beta-BHC	< 0.003	0.046	0.00061	No
105	gamma-BHC	< 0.002	0.063	0.0017	No
106	delta-BHC	< 0.002	No Criteria	0.00013	No
107	Chlordane (303 d listed)	< 0.004	0.00059	0.00057	No
108	4,4-DDT (303 d listed)	< 0.002	0.00059	0.00020	No
109	4,4-DDE	< 0.0018	0.00059	0.00068	No
110	4,4-DDD	< 0.002	0.00084	0.00077	No
111	Dieldrin (303d)	< 0.002	0.00014	0.00029	No
112	alpha-Endosulfan	< 0.002	0.0087	0.000027	No
113	beta-Endosulfan	< 0.002	0.0087	0.000046	No
114	Endosulfan Sulfate	0.016	240	0.00016	No
115	Endrin	< 0.001	0.0023	0.00012	No
116	Endrin Aldehyde	< 0.002	0.81	Not Available	No
117	**Heptachlor**	**0.038**	**0.00021**	**0.000022**	**Yes**
118	Heptachlor Epoxide	< 0.002	0.00011	0.00017	No
119-125	PCBs sum (303 d listed)	< 0.02	0.00017	0.0040	No
126	Toxaphene	< 0.03	0.0002	Not Available	No
	Tributyltin	**0.013**	**0.0074**	**0.003**	**Yes**
	Total PAHs	< 0.01	15	0.38	No
	Total Ammonia (as N)	900	1700	890	No

Footnote for Table F-10:

(1) The MEC and maximum background concentration are the actual detected concentrations unless preceded by a "<" sign, in which case the value shown is the minimum detection level (DL).

(2) The MEC or maximum background concentration is "Not Available" when there are no monitoring data for the constituent.

(3) RPA Results = Yes, if MEC > WQO/WQC, B > WQO/WQC and MEC is detected, or Trigger 3;
= No, if MEC and B are < WQO/WQC or all effluent data are undetected;
= Undetermined (Ud), if no criteria have been promulgated or there are insufficient data.

f. **Constituents with limited data.** In some cases, Reasonable Potential cannot be determined because effluent data or ambient background concentrations are not available. The Dischargers will continue to monitor for these constituents in the effluent using analytical methods that provide the best feasible detection limits. When additional data become available, further RPA will be conducted to determine whether to add numeric effluent limitations to this Order or to continue monitoring.

g. **Pollutants with no Reasonable Potential.** WQBELs are not included in this Order for constituents that do not demonstrate Reasonable Potential; however, monitoring for those pollutants is still required. If concentrations of these constituents are found to have increased significantly, the Dischargers are required to investigate the source(s) of the

increase(s). Remedial measures are required if the increases pose a threat to water quality in the receiving water.

The previous Order included effluent limits for 4,4-DDE, dieldrin, heptachlor epoxide, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene; however, effluent limitations for these pollutants are not retained by this Order because these pollutants do not have Reasonable Potential. This elimination of these effluent limits is consistent with anti-backsliding requirements in accordance with State Water Board Order WQ 2001-16.

4. WQBEL Calculations.

a. **Pollutants with Reasonable Potential.** WQBELs were developed for the toxic and priority pollutants that were determined to have reasonable potential to cause or contribute to exceedances of the WQOs or WQC. The WQBELs were calculated based on appropriate WQOs/WQC and the appropriate procedures specified in Section 1.4 of the SIP. The WQOs or WQC used for each pollutant with Reasonable Potential are discussed below.

b. **Shallow Water Discharge.** The Discharger's effluent is discharged to a shallow water slough, the Artesian Slough. Due to the tidal nature of the Slough, and limited upstream freshwater flows, the discharge is classified by the Regional Water Board as a shallow water discharge.

c. **Dilution Credit.** The shallow receiving waters support biologically sensitive and critical habitats. Therefore, no dilution credit (D=0) was used to calculate WQBELs for most pollutants, with the exception of cyanide, which is a non-persistent pollutant that readily degrades to a non-toxic state.

Cyanide attenuates in receiving waters due to both degradation and dilution. Dilution credits for cyanide for shallow water discharges are established in the Basin Plan. The dilution credit accounts for attenuation of cyanide in the receiving water. A dilution ratio of 3:1 (D = 2.0) for the discharge has been applied in calculating effluent limitations for cyanide.

d. Development of WQBELs for Specific Pollutants

(1) Copper

i. *Copper WQC.* The most stringent copper chronic and acute marine WQC of 6.9 and 10.8 µg/L are the Basin Plan SSOs for South San Francisco Bay, expressed as dissolved metal. Regional Water Board staff converted these WQC to total recoverable metal using the Basin Plan site-specific translator of 0.53. The resulting chronic WQC of 13 µg/L and acute WQC of 20 µg/L were used in the RPA.

ii. *RPA Results.* Copper historically has been a pollutant of concern in South San Francisco Bay. To ensure that ambient levels of copper in South San Francisco Bay do not increase as a result of POTW discharges, the Basin Plan requires NPDES permits to include copper effluent limits for South San Francisco Bay dischargers.